CLAIM SUMMARY DOCUMENT:

1. (Currently Amended) A field emission device (FED) comprising:

a substrate;

a cathode formed over the substrate;

micro-tips having nano-sized surface features each micro tip being of homogenous material, formed ~~on~~ in electrical contact with the cathode;

a gate insulation layer with wells each of which a single micro-tip is located in, the gate insulation layer formed over the substrate; and

a gate electrode with gates aligned with the wells such that each of the micro-tips is exposed through a corresponding gate, the gate electrode formed on the gate insulation layer.

2. (Currently Amended) The field emission device of claim 1, wherein a resistor layer is formed over or beneath the cathode, or ~~a~~ resistor layers ~~is~~ are formed over and beneath the cathode.

3. (Original) A method for fabricating a field emission device (FED), comprising:

forming a cathode, a gate insulation layer with wells, and a gate electrode with gates on a substrate in sequence, and forming micro-tips on the cathode exposed by the wells;

forming a carbonaceous polymer layer on the gate electrode, such that the wells having the micro-tips are filled with the carbonaceous polymer layer; and

etching the carbonaceous polymer layer and the surface of the micro-tips by plasma etching using a gas mixture containing O_2 for the carbonaceous polymer layer, and a gas for the micro-tips, as a reaction gas, so that the micro-tips with nano-sized surface features are formed.

4. (Original) The method of claim 3, wherein the carbonaceous polymer layer is formed of polyimide or photoresist.

5. (Original) The method of claim 3, wherein the carbonaceous polymer layer is etched by reactive ion etching (REI).

6. (Original) The method of claim 5, wherein the nano-sized surface features of the micro-tips are adjusted by varying the etch rates of the carbonaceous polymer layer and the micro-tips.

7. (Original) The method of claim 6, wherein the etch rates are adjusted by varying the oxygen-to-the gas for the micro-chips in the reaction gas, plasma power, or plasma pressure during the etching process.

8. (Original) The method of claim 5, wherein the micro-tips are formed of at least one selected from the group molybdenum (Mo), tungsten (W), silicon (Si) and diamond, and the reaction gas is a gas mixture of O_2 and fluorine-based gas.

9. (Original) The method of claim 8, wherein the reaction gas comprises CF_4/O_2, SF_6/O_2, CHF_3/O_2, $CF_4/SF_6/O_2$, $CF_4/CHF_3/O_2$, and $SF_6/CHF_3/O_2$.

10. (Original) The method of claim 5, wherein the micro-tips are formed of at least one selected from the group molybdenum (Mo), tungsten (W), silicon (Si) and diamond, and the reaction gas is a gas mixture of O_2 and chlorine-based gas.

11. (Original) The method of claim 10, wherein the reaction gas comprises Cl_2/O_2, CCl_4/O_2, and $Cl_2/CCl_4/O_2$.

12. (Original) A method of fabricating a field emission device (FED) comprising:

providing a substrate;

forming a cathode over the substrate;

forming micro-tips having nano-sized surface features on the cathode;

providing a gate insulation layer with wells each of which a single micro-tip is located in, the gate insulation layer formed over the substrate; and

providing a gate electrode with gates aligned with the wells such that each of the micro-tips is exposed through a corresponding gate, the gate electrode formed on the gate insulation layer.

13. (Original) The method of claim 12, further comprising forming a resistor layer over or beneath the cathode, or forming a resistor layers over and beneath the cathode.

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14. (New) A field emission device (FED) comprising:

a substrate;

a cathode formed over the substrate;

micro-tips having nano-sized surface features, formed in electrical contact with the cathode;

a gate insulation layer with wells each of which a single micro-tip is located in, the gate insulation layer formed over the substrate;

a gate electrode with gates aligned with the wells such that each of the micro-tips is exposed through a corresponding gate, the gate electrode formed on the gate insulation layer,

wherein said micro-tips having nano-sized surface features is the product of a process of forming a carbonaceous polymer layer on the gate electrode, such that the wells having them micro-tips are filled with the carbonation polymer layer; and etching the carbonaceous layer and the surface of the micro-tips by plasma etching using a gas mixture

O_2 for the carbonaceous polymer layer, and a gas for the micro-tips, as a reaction gas, so that the micro-tips with nano-sized surface features are formed.

15. (New) The field emission device of claim 14, wherein a resistor layer is formed over or beneath the cathode, or resistor layers formed over and beneath the cathode.